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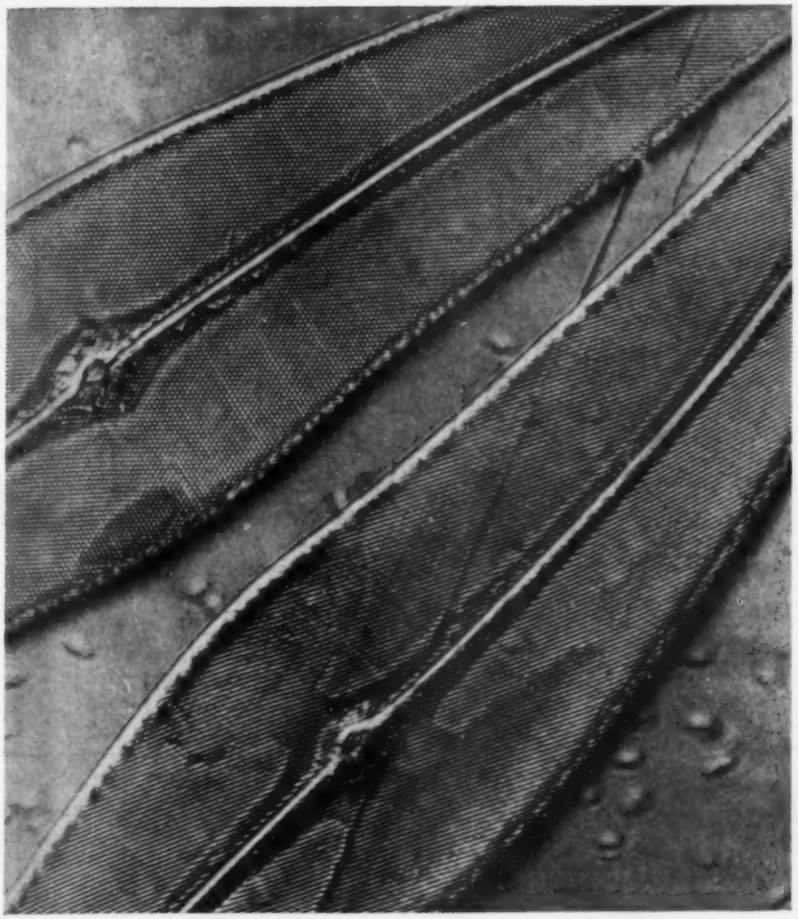
SCIENCE NEWS LETTER

THE WEEKLY SUMMARY OF CURRENT SCIENCE •



December 30, 1939

Test For Fine Lenses

See Page 421

A SCIENCE SERVICE PUBLICATION

Do You Know?

Ninety-nine per cent. of the machetes, all-purpose knives used in tropical America, are made in Connecticut.

Ancient Egypt began its year in the middle of October, when the Nile flood was receding and seed-planting time began.

Federal inspection of public land tracts sometimes calls for examining tiny areas, one being an inch wide and 70 feet long.

In camouflaging factories, paints produce the effect of a row of cottages; and even illusion of a road may be achieved by paint on landscape and roofs.

The most promising curb for the Japanese beetle pest is "milky disease," which attacks the beetle grubs, turning the body fluids milky white, but even this does not promise to eliminate the pest.

The mouths of animals under normal conditions are reported to be cleaner than the mouth of man, due to chemical difference in the saliva which results in low bacterial count and absence of those bacteria which move about the mouth cavity.

Finding a cave which had been occupied by prehistoric Pueblo Indians, CCC boys showed their understanding of conservation policies by leaving the water jar, gourd dipper and other objects in place and reporting the find for archaeologists to examine undisturbed.

QUESTIONS DISCUSSED IN THIS ISSUE

Most articles which appear in SCIENCE NEWS LETTER *are based on communications to Science Service, or on papers before meetings. Where published sources are used they are referred to in the article.*

ANTHROPOLOGY

Why is the newly discovered Pithecanthropus skull of great importance to science? p. 425.

MEDICINE

What is the newest life-saving member of the sulfanilamide family? p. 425.

What new weapon is being used against undulant fever? p. 425.

GENERAL SCIENCE

How can atoms be sorted for weight? p. 421.

How do plants recovering from virus disease differ from human convalescents? p. 422.

What are the gravest dangers to democracy? p. 419.

What distinguishes Acadians today from their American neighbors? p. 421.

What effect have students' health defects on college grades? p. 422.

What has been discovered about the comparative sensitiveness of right and left hands and feet? p. 422.

What is considered a most important duty of science in the present emergency? p. 420.

PUBLIC HEALTH

What diseases still claim high death tolls? p. 423.

More than half of the regular Indian Service employees are now Indians.

Paper picnic plates are being made with aluminum foil facing, for greater strength.

Forty-six swordfish have been tagged by shooting marked darts into them in the past two years, in hope of finding out where they travel.

Alaskan conservation officials have swapped a black timber wolf and a pair of wolverines to Wisconsin in exchange for some pheasants.

Red and green neon lights are being tried out as under-water lures to attract insects—a new idea in providing food for fish in hatcheries.

A New Jersey machinist as a hobby built an automobile entirely by hand, and working five hours a day average, he spent 12 years on the job.

Some of the most life-like snakes and fishes in museums are now made of molded rubber.

A generous portion of raw cranberry relish may add considerable vitamin C to the diet, says a nutritionist.

To feed Greater London's 9,500,000 people would require farm lands slightly bigger than the whole of Ireland.

Although Oxford University is on a wartime basis, it is continuing scheduled work on its new chemical and physics laboratories.

London is trying out its first "producer-gas" bus, which is equipped with a stove device for consuming hard coal, charcoal, or peat.

In early days in Australia, missionaries agreed to standardize spelling of native names, and accepted a single way of pronouncing vowels.

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GENERAL SCIENCE

Call To Action Sounded For All Men of Science

Retiring President of A. A. A. S. Warns That Ignorance Is Gravest Danger to Democracy; Teaching Urgent Need

A CALL to action for scientific men to take a crucial part in the present struggle to maintain democracy and freedom, was issued by Dr. Wesley C. Mitchell, research director of the National Bureau of Economic Research and economics professor at Columbia University, when he delivered as its retiring president the keynote address of the meeting of the American Association for the Advancement of Science in Columbus, Ohio.

The world of science can make a major contribution to the preservation of the institutions that secure freedom to all citizens, Dr. Mitchell declared.

"The gravest dangers to democracy come from within, not from without," he warned. "They are ignorance and propaganda that turns ignorance to its uses. The best way of dispelling ignorance is by diffusing knowledge. The most effective defense against meretricious propaganda is critical inquiry. John Dewey is warranted in saying that 'the future of democracy is allied with spread of the scientific attitude.' To foster this attitude among their fellow citizens by all means within their power is a duty incumbent upon us who cherish science.

"As teachers in schools and colleges we can help thousands to develop respect for evidence. As citizens we can be brave opponents of prejudice and hysteria. We can promote general understanding of the methods and results of science through our own writings or those of allies more skilled in popular exposition. These things we should do, not as high priests assured that they are always right, but as workers who have learned a method of treating problems that wins cumulative successes, and who would like to share that method with others."

To increase knowledge of human behavior was declared by Dr. Mitchell to be "the most urgent item in the unfinished business of science.

"If we had keener insight into individual psychology," he said, "we might not be able to alter fundamental drives, but we might be able to direct them into beneficent channels. Preaching righteousness doubtless prevents men from being as bestial as they might otherwise become. Appeals to reason prevent them from making as many errors as they otherwise might. But the moralist and the rationalist admit that the results of their efforts are grievously disappointing.

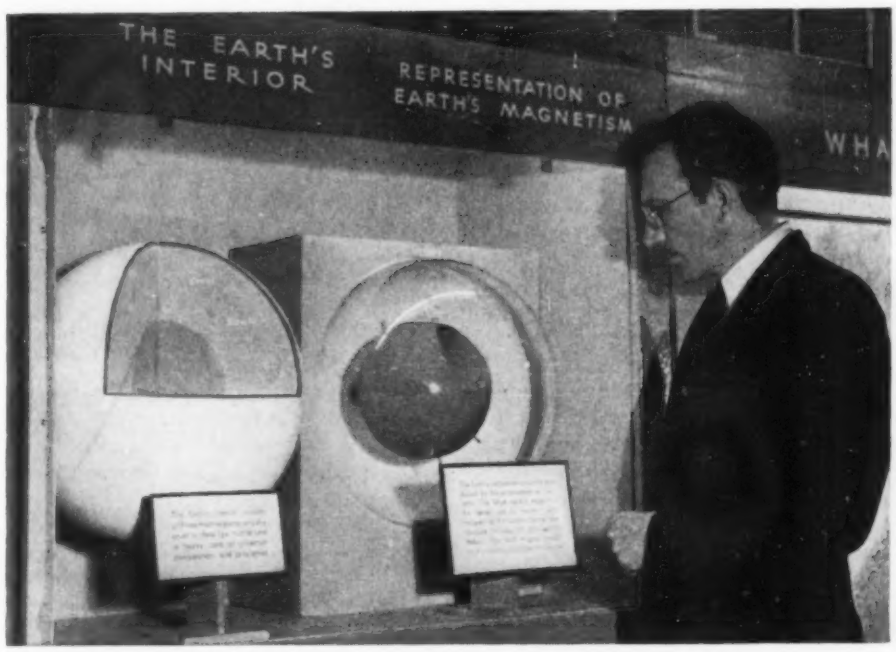
"Scientific men with any gift of self-analysis realize that they have their own shares of selfishness and animosities. To subdue traits in oneself is hard enough to give an inkling of the difficulty of controlling them in society at large. Perhaps, and perhaps is all we can say, if we can come to a clearer understanding of how we behave, we can learn how to condition men so that their energies will go less into making one another miserable.

"One of the things we have learned about individual behavior is that it is influenced greatly by social environment," Dr. Mitchell continued. "In John Dewey's phrase, 'all psychology is social psychology.' Improving knowledge of social organization and its working is therefore part and parcel of the urgent task of learning how men behave. Though we may believe ourselves citizens of the most fortunate nation in the world, we have no more reason for complacency about the way in which our social organization works than for complacency about individual behavior.

"For example, our economic organization does not permit us to buy from one another as much wealth as our workers are able and eager to produce. Even in the best of years we fail to provide a national income large enough to give American families on the average what experts on household economics hold to be a standard of living adequate to maintain efficiency.

"In bad years this adequate income falls off by a fifth or a sixth; in the very worst years by 40% or more. All this is true of our industrial equipment and practise as they stand. Proud as they are of our technological progress, engineers know that much of our equipment and many of our methods are far behind the times. We fail to make full use of knowledge that technological applications of scientific discoveries have put at our disposal.

"I might develop the shortcomings of our economic organization at great length,



EARTH'S MAGNETIC FIELD DUPLICATED

For the first time, a cluster of magnets has been assembled so that they reproduce the magnetic field of the earth and its yearly changes. Dr. A. G. McNish, of the Department of Terrestrial Magnetism is demonstrating the model at the Carnegie Institution of Washington's annual exhibit.

and then go on to exploit the weaknesses of our political and sociological institutions. It is needless to do so; for every candid and intelligent citizen can point out defects however convinced he may be that, with all its faults, the American scheme of institutions is the best in the world. If scientists can do more than other intelligent citizens toward improving social organization, their contribution will consist in raising knowledge of social practice."

Dr. Mitchell admitted that social sciences lag far behind the natural sciences. This is "because they deal with phenomena more complicated, more variable, and less susceptible of experimental manipulation. Since social investigators cannot experiment at will upon social groups, they cannot effectively apply to their problems the methods that have made the laboratory sciences strong."

"Yet the case of economics and its sister sciences is not hopeless," in Dr. Mitchell's opinion.

"The rapid growth of statistics is providing mass observations upon social behavior of many kinds," he said. "The equally rapid growth of statistical technique enables us to learn more from a given array of data than our predecessors could. These materials and methods are making it possible to measure many social factors, some rather accurately, some roughly. Uniformities appear not only in averages, but also in the way in which individual items are distributed about their means. Statements in terms of probability can be substituted for vague statements about the effect a certain cause 'tends' to produce.

"True, work on this observational basis encounters many difficulties. It is limited by the variety, extent, and accuracy of reliable data upon human behavior. It is laborious, slow and expensive. In presenting his work a realistic investigator begins with a critique of his data and methods; he ends by setting forth the probable errors and limitations of his results, and the road from the beginning to the end may be long. Instead of definitive conclusions he thinks others should accept, he presents tentative approximations he expects others to improve.

"The work has not even the advantage of calling for less hard thinking than speculative theorizing; for the relations among the variables in the problem are seldom manifest of themselves. All that can be claimed for this type of work is that it deals with actual experience, that its results stand or fall by the test of conformity to fact, and that it grows cumulatively after the fashion of the observational sciences. But that is enough to give mankind strong reason for following this lead in seeking the knowledge required to improve social organization.

"Because of difficulties inhering in their subject matter, the social sciences will continue indefinitely to lag behind the natural sciences in precision and reliability. For a long time to come we shall have to form our opinions on many social issues in the light of commonsense rather than of science."

Dr. Mitchell advised scientists as citizens to "suspect the intelligence, candor or the disinterestedness of those who promise sure cures for social ills."

Unless freedom of thought prevails, Dr. Mitchell warned, science cannot flourish in the future and yield the fruits for which we hope.

"Freedom is a condition we have been inclined to take for granted as part of the heritage our predecessors won," he said. "Now we realize that what they fought to win we must fight to maintain. The investigator's right to follow truth wherever it led was part of the common man's right to freedom of conscience and freedom of speech. These rights were established by political struggles and embodied in political institutions. The democratic way of life and the scientific way of thinking grew up together, each nourishing the other. If one now fails the other will falter. Where democracy is suppressed today science is fettered; for autocracy cannot brook disinterested criticism of its dogmas or its practises. Freedom for scientific work in the years to come can be guaranteed only by preserving the institutions that secure freedom to all citizens."

Science News Letter, December 30, 1939

GENERAL SCIENCE

Protection of Civilians Is Paramount Duty of Science

PROTECTION of civilian population from attack by deadly weapons that science has created is set forth as one of the paramount duties of science in the present emergency, in the annual report by Dr. Vannevar Bush, president of the Carnegie Institution of Washington. This is Dr. Bush's first report since he became president at the beginning of the year.

Dr. Bush said that the far-flung research institution which he heads "should not fail to press its efforts" if it "sees a way in which its activities and facilities can aid this great problem of protection of civilian population from attack."

The scientist is "faced with a quandary" in a world much of which is at war, Dr. Bush said, adding:

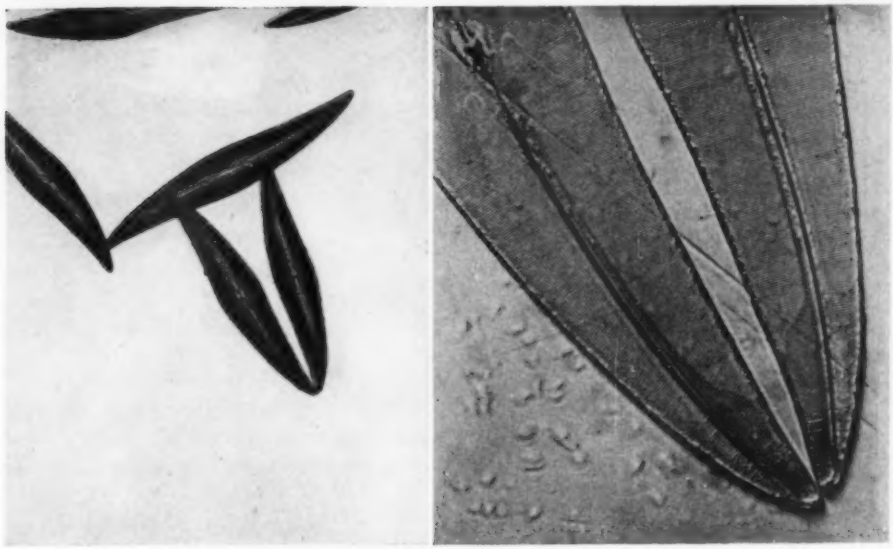
"The same science which saves life and renders it rich and full, also destroys it and renders it horrible. Is it then possible to remain in a detached atmosphere, to cultivate the slowly growing body of pure scientific knowledge, and to labor apart from the intense struggle in which the direct application of science now implies so much for good or ill?

"Science and its applications have produced the aircraft and the bomb. Entirely apart from all questions of national sympathies, from all opinion concerning political ideologies, we fear to witness the destruction of the treasures of civilization and the agony of peoples, by reason of this new weapon. As science has produced a weapon, so also can it produce in time a defense against it. Science is dedicated to the advance of knowledge for the benefit of man. Here is a sphere where the benefit might perhaps indeed be immediate, real and satisfying. Can a scientist, skilled in a field such that his efforts might readily be directed to the attainment of applications which would afford protection to his fellow men against such an overwhelming peril, now justify expending his effort for any other and more remote cause?"

Although immediate participation of the scientist in the safeguarding of civilization is urged by Dr. Bush, he warned that we should not become stampeded.

"There is still a duty to keep the torch of pure science lit, and this duty is only the greater under stress," he said. "All the long struggle of a harsh evolution, the pitting of species against the environment, has produced a being whose primary distinction is conscious cerebration, and whose crowning attribute is his intellectual curiosity concerning his complex environment and a thirst for knowledge transcending the mere struggle for existence.

Science News Letter, December 30, 1939



DIATOMS TEST LENS QUALITY

Finer and more even than any lines that can be made by human device are the sculpturings on the silica shells of the one-celled water-plants known as diatoms. They have long been used as critical test objects for determining the quality of microscope lenses. The two tips (at right) and the two center portions (on front cover) are from the neighborly pair shown in lower magnification at left. The photomicrographs are by Dr. Charles Goosmann of Cincinnati.

GENERAL SCIENCE

Low Cost "Atom Sifter" Sorts Atoms By Their Weight

Reports From Scientists in All Fields Are Gift To Public at Christmas Meetings in Columbus, Ohio

A NEW low cost "atom sifter" that sorts out atoms by weight and which will have important value for investigations of human, plant and animal physiology and in organic chemistry was described before the American Association for the Advancement of Science, meeting in Columbus, by Dr. Alfred O. Nier of the University of Minnesota.

Speaking before the symposium of the AAAS on "Isotopes," Dr. Nier told of a small mass spectrograph by which it is readily possible to determine the abundance of isotopes in a given sample. Isotopes are varieties of an element which have the same chemical properties but slightly different atomic weights.

In normal carbon, Dr. Nier explained as an example, 99 out of every 100 atoms have an atomic weight of 12 and one atom has an atomic weight of 13. If sufficient quantities of these heavy carbon atoms can be obtained, they can serve as "tracers" to study how plants transform the atoms of carbon dioxide of the air into their body substance, how organic compounds containing carbon are created, or how the human body utilizes so many of the carbon compounds of which it is composed.

By a variety of methods, Dr. Nier explained, scientists have learned how to concentrate heavy carbon and increase its concentration over its normal one per cent. Enriched samples of carbon have been obtained containing 30 per cent. heavy carbon of mass 13.

However, for exact experiment with plants and animals and in chemistry it is not merely sufficient to have these heavy carbon atoms present. The investigator must also know exactly the relative abundance of the heavy carbon present.

And that is where Dr. Nier's atom sifter comes in. This apparatus, a small mass spectrograph, bombards a gas or vapor of the element (it may be carbon, or oxygen, nitrogen or hydrogen) with a stream of electrons. The neutral gas atoms are thus turned into ions with an electric charge, which makes them susceptible to electric and magnetic fields.

By a suitable adjustment of these fields in the mass spectrograph it is possible to sort out the different weights of ions present. Since the ions carry an electrical charge the number present for each isotope is proportional to the electric currents, which can be read off on sensitive electric meters. The ratio of these currents is thus a ratio of the abundance of the isotopes present. For some elements there may be several isotopes.

Ordinary mass spectrographs have large magnets costing $500 or more and they consume several kilowatts of power to generate their magnetic fields. Dr. Nier's new, compact unit has a magnet costing only $20 for materials and consumes only 20 watts of power, about enough to light a dim, weak electric light. Several hundred dollars of auxiliary equipment is also needed but this is necessary no matter what type of mass spectrograph is employed.

In other reports to the symposium on isotopes Dr. Hugh S. Taylor of Princeton University showed how light and heavy nitrogen isotopes are being used to study the chemical reactions which produce ammonia synthetically in the presence of a catalyst.

Dr. Lloyd P. Smith of Cornell University told of a new kind of electric ion source which makes available large numbers of ions for use in mass spectrographs.

Dr. W. W. Watson of Yale University described the construction and operation of a multi-stage thermal diffusion apparatus for the concentration of heavy carbon of mass 13.

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Acadians Are Americanized

ACADIAN Frenchmen in Louisiana, descendants of exiles from Nova Scotia of "Evangeline" fame, are now physically Americanized. Only their accent and social customs distinguish these French-speaking people, who have maintained a high degree of isolation in their southern home, Prof. Harley N. Gould of Tulane University reported.

The Acadian in Louisiana today is strikingly taller than Frenchmen in in France, and also taller than American soldiers of French ancestry in the U. S. Army, Prof. Gould learned by measuring 100 of the young men. There were few

DETECT RADIOACTIVITY

Mickey and Minnie showed visitors at the Carnegie Institution exhibit how radioactive salts can be detected in the body. As Mickey passes the Geiger counter in the apparatus being demonstrated by Dean B. Cowie, the clicks betray his diet.

true blonds and no red heads in the group measured. Merging of the Acadians into American stock, which is likely to take place, will have little effect on physique of future generations, the study shows.

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Leaders a Strong Force

NOTABLE success of Canada's Iroquois and Blackfoot Indians in adapting to civilization was attributed largely to able leadership of their far-seeing chiefs, by Dr. Diamond Jenness anthropologist of the National Museum of Canada.

Citing these Indians as examples of a frequently overlooked truth, Dr. Jenness declared that "the strongest forces for the regeneration or upbuilding of peoples come from within their own ranks, not from without." The ideal capable of stimulating a people may lie dormant for years or centuries, "as did the longing for liberty in Finland and Poland" unless some great leader arises to give it voice and to carry the people with him, the Canadian anthropologist stated.

"Every administration that deals with a native race," he advised, "should aim, first of all, to inspire or foster in that race some desirable goal and then to promote the evolution of native leaders who will command the confidence of their people and guide them toward that goal."

Dr. Jenness stated that the steadfast belief of Canadian governments has been that the Dominion's aborigines should gradually fuse with whites. He predicted for the American Arctic a population of hardy frontiersmen carrying in their veins a strain of Eskimo blood, but speaking a European language.

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Either Foot Can Hurt

YOU may be able to kick better with your right foot than your left, but a corn will be equally painful on either side, Dr. L. Pearl Gardner, psychologist of Cornell University, told the meeting.

Blindfolded and running their toes delicately over different grades of sandpaper, different sizes of corks and marbles, and other articles of various shapes, 85 college students demonstrated in Dr. Gardner's experiment, that people are not pronouncedly either right-footed or left-footed in ability to feel.

Although most of the group were slightly faster in sorting by feel with the right foot than with the left, the right foot was responsible for more errors.

There is more evidence of laterality in the hands, however. Left hands are quicker but slightly less accurate than right hands. But left-handed persons prefer to use the left hand for sorting by feel and are justified in so doing; their left hands would select more rapidly and more accurately.

Girls are either more sensitive than men or they take time to make sure about minute differences in perception, Dr. Gardner found, for although the men had a higher speed, they made more errors.

The matter of sidedness is important, Dr. Gardner explained, because when a naturally right- or left-handed person is forced to use the other hand, he may be retarded in reading, writing, or spelling. Dr. Gardner is investigating the importance of sidedness in sensitivity as compared with sidedness in motor skill.

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Bad Health No Excuse

THE COLLEGE boy or girl who makes low grades needn't blame illness or physical defect. With less than 9% of students do physical conditions cause failure, Dr. A. S. Edwards, of the University of Georgia, reported on the basis of a survey made at that University.

If any relation can be found between physical defect and academic achievement, it is an inverse one, he said—the more physical defects and the more serious they are, the higher the grades. Those in the top third of the class in academic standing have as high a percentage of defects and illnesses as those in the lower groups.

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Conditioned Under Hypnosis

A MAN psychologically "conditioned" in a deep hypnotic sleep by smelling creosote during the ringing of a bell will afterwards have a vivid image of the odor of creosote whenever in the waking state he hears the ringing of that bell.

Results of a number of such experiments linking under hypnosis visual, auditory, olfactory, tactual and pain sensations in various combinations, were reported to the meeting by Dr. Clarence Leuba, of Antioch College.

Combinations learned in this way, he found, will later be reproduced automatically without any conscious process or the consciously remembered associations postulated by the classic laws of association.

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Recovered Plants Immune

BEHAVIOR of tobacco plants after recovering from the virus disease known as curly top was described by Dr. James M. Wallace of the U. S. Department of Agriculture. The plants were immune to further attacks of the same and closely related viruses, just as a human being who has had smallpox once is immune to that disease.

Unlike the human convalescent, however, the recovered plants continue to harbor the virus, and healthy plants can be made sick by transfer-inoculation from them. However, it does not seem to be as potent for mischief as virus taken from plants while they are still actively sick.

It was also found that tomato plants could be protected against the virus to some extent at least, by grafting upon them shoots from recovered tobacco plants.

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In making a muskrat coat several thousand pelts may be examined before about 75 are chosen for matched color and quality.

PUBLIC HEALTH

Health Gains of 1939 Will Be Carried Onward in 1940

War Brings Danger of World Wide Epidemics, But If Spared Such Ills, We Should Have Healthful Year

By DR. LOUIS I. DUBLIN

Third Vice-President and Statistician, Metropolitan Life Insurance Company

FOR SOME years, it has been my custom at this time to attempt a forecast of the health conditions likely to prevail during the coming year. My prediction for 1939 was unusually optimistic; and so it is especially gratifying to observe how closely conditions have followed the course I anticipated. It can now be said with safety that 1939 will go down as one of the most healthful years in our history. In fact, it may even excel the banner year 1938 by a small margin.

My evidence for this statement is primarily the experience of the many millions of Industrial policyholders of the Metropolitan Life Insurance Company. These men, women and children, scattered as they are through every part of the United States and Canada, form a very fair cross-section of the general population of these countries and their experience is a very sensitive index of the general health conditions in this part of the world.

In my prediction last year, I pointed out the possibility of an outbreak of influenza. This actually occurred early in 1939. The epidemic swept the Southern and Central States, reaching its peak in March. Fortunately, the type of the disease was fairly mild, and it therefore failed to cause as many deaths as might have been expected in view of the large number of cases reported.

Nevertheless, the effect of this epidemic on the general mortality of the people was noteworthy. Deaths from heart disease, from diabetes, from cerebral hemorrhage and from cancer increased perceptibly over the year before.

This is a phenomenon which has been observed many times before. Older people suffering from these conditions are much more prone to die as the result of an attack of influenza. By the end of May, the death rate among these policyholders was three and one-half per cent higher than for the year before.

Beginning in June, however, and continuing in each of the succeeding months, the mortality declined to new lows, so that at the end of November the early excess of this year's death rate had been entirely erased.

In fact, with no untoward indication on the horizon we can now safely say that 1939 will register the best mortality in the history of this large group of insured people. And there is a fair chance that the same will be found true for the people of the United States and Canada when the official records become available.

One of the most gratifying features of the 1939 health picture is the low death rate from pneumonia. Present figures indicate that the current year will register the very lowest mortality from this disease ever experienced in this country. Undoubtedly, a good part of this achievement can be attributed to the new treatment for pneumococcal pneumonia with sulfapyridine and type-specific antiserums. The widespread adoption of this treatment with the splendid results universally reported, promises to relegate within a few years this hitherto dreaded scourge to a minor position among the important causes of death.

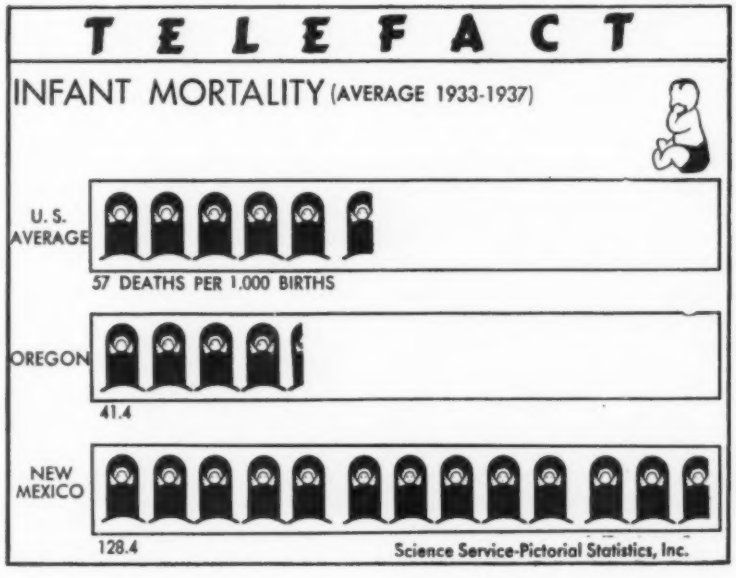
Tuberculosis is another disease that is rapidly being wiped out in this country. Indeed, if it were not for the large colored population which is still peculiarly susceptible to the disease, the United States would have one of the lowest, if not the very lowest, death rate from tuberculosis in the world.

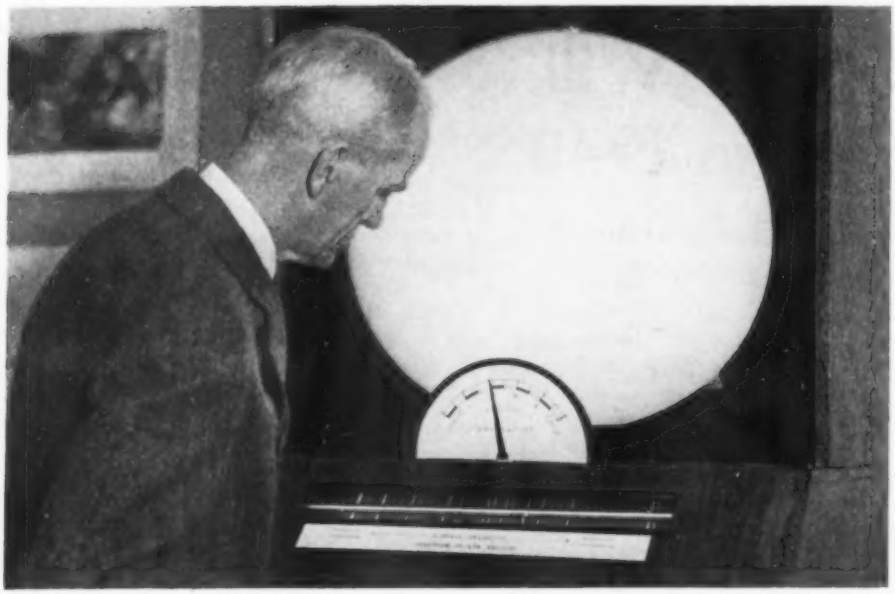
Among the Metropolitan Industrial policyholders it is very likely that this year's mortality rate from the white plague will reach the all-time low record of 45.0 per 100,000. This would indicate a final rate for the general population somewhere around 46 or 47, since the general death rate from tuberculosis in recent years has run one or two points above that of the Metropolitan policyholders.

Nineteen thirty-nine witnessed a further decline in the deaths of mothers from puerperal causes, the tenth consecutive year in which gains have been made against this form of preventable human sacrifice. Surely all will agree that herein is special cause for rejoicing. At a time when fewer and fewer women are willing to undergo the hazards of bringing babies into the world, we can ill afford to sacrifice a single one courageous enough to assume this responsibility.

The present year has been very kind to babies and young children. Those conditions and diseases chiefly responsible for the high mortality among infants, as well as the various communicable diseases of childhood, were all less prevalent than usual with the exception of infantile paralysis.

Smallpox showed a substantial de-





BALLOON SHOWS BEHAVIOR OF STAR

Dr. W. S. Adams, director of the Mt. Wilson Observatory is here shown with one of the exhibits of the Carnegie Institution of Washington. The expanding balloon represents a Cepheid variable type of star as it pulsates. The balloon changes colors to correspond with changes in stellar temperature.

crease over the last two years, although it is likely that at least 9,500 cases of this loathsome disease will have been recorded in this country before 1939 has ended. As usual, the States chiefly responsible for this disgraceful record are those in the North Central and Western sections of the country where compulsory vaccination is not generally accepted as a preventive of the disease.

I wish it were possible to report similarly gratifying progress in the control of those chronic affections resulting from the degenerative processes associated with advancing age. Reports for the current year afford no indication that we have made any progress toward checking the mortality from these conditions. In fact, such diseases as cancer, diabetes, heart disease, and cerebral hemorrhage were all responsible for still higher death tolls than they exacted during the previous year. However, little success could have been expected in this direction since we have really not yet awakened to the need and feasibility of combating these leaders among the causes of death.

However, our greatest disappointment lies in our failure to duplicate the gains of last year against motor vehicle accidents. Apparently, the gains registered in this direction during the earlier part of the year have been dissipated in the closing months. The remarkably fine weather this autumn has been conducive to increased motoring, with its accompanying grist of fatal accidents. Unless a radical change for the better occurs in the next few weeks, which seems unlikely, the number of automobile deaths this year will exceed those reported in 1938 and may run as high as 33,000.

As to the prospects for the coming year, it is perhaps too much to expect a continuation of the exceptionally favorable conditions that have prevailed during the last two years. Nevertheless, at the present writing, there is nothing that would lead one to expect otherwise. We cannot, of course, anticipate the so-called "acts of God" such as earthquakes, tidal-waves, hurricanes, etc., nor can we foresee very far in advance such visitations as the great pandemic of influenza which overwhelmed the country in the fall of 1918.

Great wars often breed widespread epidemics of diseases which ordinarily are kept under control and for that reason it is possible that we may have to cope with such an aftermath of the present deplorable situation in Europe. But this danger will be greatly mitigated if we persist in our determination not to be drawn into the conflict.

Barring such contingencies, there is every reason to believe that 1940 will be another year of good health for the American people. For one thing, there never has been a time when the people as a whole and as individuals were so health conscious as at present. More and more they are coming to realize the important place that good health has in our national economy.

Accordingly, they are demanding that the very best in the way of medical care be available to every element of the population regardless of social or economic status, whether in the remote rural sections of the country or in the large urban centers. When millions of individuals become intelligently interested in their personal health it constitutes a tremendous cooperative force that is bound to advance public welfare generally.

Already this public interest in health has begun to work wonders. It has freed us from the old taboo against the word "syphilis" so that now we are at last launched on a nationwide campaign which promises to minimize this scourge to our people.

It has brought about a unanimity of opinion among the medical profession, public health authorities, social workers and government officials concerning the necessity of drastic revision of our public health structure which seemed hopeless only a few years ago. True, there is still some divergence of opinion as to how this revision shall be brought about but there is little doubt that these differences will be adjusted satisfactorily in the near future. A National Health Law will probably be passed by Congress at its coming session and while the effects of this program are not likely to be felt immediately it is sure to benefit the health of the nation in the years to come.

Science News Letter, December 30, 1939

RADIO

W. H. Cameron, of the National Safety Council will tell how you can help reduce accidents as guest scientist on "Adventures in Science" with Watson Davis, director of Science Service, over the coast to coast network of the Columbia Broadcasting System, Thursday, January 11, 4:15 p.m., EST, 3:15 CST, 2:15 MST, 1:15 PST. Watson Davis will forecast 1940's science progress on January 4, 4:15 p.m. EST. Listen in on your local station. Listen in each Thursday.

Books

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MEDICINE

New Chemical Stops Growth Of Pus-Forming Staphylococci

New Member of Sulfanilamide Family Is Effective Against Pneumonia; Also Good for Blood Poisoning

SUCCESS with a new chemical treatment of blood-poisoning due to the pus-forming staphylococci is announced by Drs. W. E. Herrell and A. E. Brown, of the Mayo Clinic. A five-day cure in one such case is reported, as well as laboratory tests showing that the new chemical completely stops the growth of such germs.

The new chemical is sulfamethylthiazol, a member of the famous sulfanilamide family of chemical remedies. It is closely related to sulfathiazole, the chemical remedy just announced to the medical world by a research team at the Squibb Institute for Medical Research at New Brunswick, N. J. (*See SNL,* Dec. 23.) The sulfamethylthiazol used by Drs. Herrell and Brown was furnished by the medical research division of the Winthrop Chemical Company.

Like sulfathiazole, the still newer sulfamethylthiazol is as effective as sulfapyridine in curing pneumonia, with the added advantages of being less toxic and of not causing the nausea and vomiting which have been distressing features of sulfapyridine treatment. The Mayo Clinic physicians report the "striking" recovery of a pneumonia patient within 48 hours under sulfamethylthiazol treatment, and the absence of gastro-intestinal irritation during five days of treatment, although she had vomited at the onset of her illness before any drug was given.

Sulfathiazole has been hailed not only for its success in curing pneumonia but for its promise of controlling a whole new group of diseases due to the staphylococci. These pus-forming germs cause ailments ranging from boils and food poisoning to a serious blood-poisoning which kills about 90% of its victims if they are over 40 years of age.

Sulfamethylthiazol in its first human trial cured a patient dangerously ill with staphylococcus blood infection following operation for chronic gallbladder disease. Within 24 hours after the first dose of the new remedy, the patient was much improved and her temperature had dropped from 104 degrees Fahrenheit to under 100 degrees. Within 48 hours her temperature was 99 degrees F. and within five days it was normal. She had no gastro-intestinal irritation and was able to take her meals regularly, although with sulfapyridine treatment, first tried, she became so sick that the medicine had to be discontinued.

Sulfamethylthiazol came out on top in test tube trials of the anti-staphylococcus power of this new chemical and of sulfathiazole, sulfapyridine and sulfanilamide, Drs. Herrell and Brown report. The drugs were added in equal concentrations to broth cultures each containing from 12 to 15 colonies of the germs in 0.1 c.c. of the mixture. At the end of the first seven hours, a control tube with no drugs had 21,360 colonies in the measured amount of broth. The tube with sulfanilamide contained 2,760 colonies, the sulfapyridine tube contained 2,820 colonies, the sulfathiazole tube had a count of 2,400 colonies, but the sulfamethylthiazol tube still contained only 15 colonies. In other words, the germs were completely unable to multiply in the presence of the newest chemical remedy.

Science News Letter, December 30, 1939

ANTHROPOLOGY

Fourth Pithecanthropus First Adult Male for Study

THE important discovery of a fourth skull of the world's ancient pre-human species, known to science as Pithecanthropus, or the Ape Man of Java, is announced to the Carnegie Institution of Washington by Dr. G. H. R. von Koenigswald.

Slain by a violent blow on the back of the head from a club or stone weapon, the ancient pre-human now found will provide science with first opportunity to study a grown male skull of this early Stone Age type. The other three Pithecanthropus skulls, all smaller, are now more positively identified as remains of two grown females and a young individual of uncertain age.

Portions of the fourth representative of the species unearthed consist of the upper jaw nearly complete and lacking only two molar teeth, and part of the back of the cranium still bearing marks of the death blow.

Comparing Java's ancient pre-humans with remains of Peking Man which have been coming to light in China, Dr. von Koenigswald declares the two types closely related. They undoubtedly represent the most primitive man-like forms known, he concludes, and their differences were such as might be expected of two races of present day humankind.

Not agreed as to when these two most ancient types of Java and China lived, scientists have variously estimated their antiquity at 500,000 to 1,000,000 years, some regarding Java Man as the older.

Dr. von Koenigswald does not believe it possible to decide yet which of the two was more primitive. Pithecanthropus of Java appears more primitive in such points as the proportions in size of molar teeth and structure of back and temporal portions of the skull. But Peking Man also had his primitive features discernible to the specialist, such as strongly developed grinding teeth, more complicated tooth patterns, and the manner in which the forehead connected with eyebrow ridges.

Hailing Java as the world's most important center for study of prehominid forms, Dr. von Koenigswald points out that discoveries there also have revealed valuable evidence of later mankind of Stone Age eras.

Science News Letter, December 30, 1939

MEDICINE

Undulant Fever Antiserum Helped Three Out of Five

A NEW antiserum for undulant fever that quickly brought the temperature to normal in three out of five patients in its first clinical trials has been developed by Drs. I. Forest Huddleston and R. B. Pennell, of Michigan State College. (*Science,* Dec. 15.)

Undulant fever is a serious and long-drawn-out ailment characterized by frequent relapses after the patient has apparently recovered. It afflicts goats and cows. Humans usually get it from drinking unpasteurized milk of infected animals.

Guinea-pig trials of the new antiserum before it was given to the patients showed that, when given at least 10 minutes before a dose of undulant fever germs, very small amounts of it protected the animals.

Science News Letter, December 30, 1939

First Glances at New Books

Geography

FLORIDA, A GUIDE TO THE SOUTHERNMOST STATE—Federal Writers' Project—*Oxford Univ. Press,* 600 p., $2.50. Timely in view of the South's expectation of an unusually large flock of winter visitors, this comprehensive tourbook and guide should prove popular with motorists and sightseers, and also those who like to know about a State's people, its problems, history and resources.

Science News Letter, December 30, 1939

Zoology

LAND MOLLUSCA OF NORTH AMERICA (NORTH OF MEXICO), Vol. I, Pt. 1—Henry A. Pilsbry—*Acad. of Nat. Sciences of Philadelphia,* 582 p., $10. (To be published in 3 vols. By subscription to entire work, Vol. I, $7.50; Vol. II, $7.50; Vol. III, $10.) A monumental work by America's best known malacologist, this monograph has been eagerly awaited by his fellow specialists and by zoologists generally. It has little popular appeal, but its scientific value is immense.

Science News Letter, December 30, 1939

Geography

DISCOVER PUERTO RICO—John W. Vandercook—*Harper,* 44 p., $1. A gift-book type of guide, appropriate for deck reading in the Caribbean. It tells in essay style what the island of Puerto Rico is like, leaving prosaic maps, rates, and directions for other guide books to supply.

Science News Letter, December 30, 1939

Ethnology

THE AMERICAN INDIAN—Sue Northey—*Bradley,* 216 p., $2. Ethnology for school boys and girls, presented simply and with good choice of detail. It describes life in the Northwest and Southwest as well as Plains and Woodlands, and provides a good antidote for the stereotyped notion of "an Indian" in many children's minds.

Science News Letter, December 30, 1939

Public Health—Engineering

ELEMENTS OF SANITATION—Edward S. Hopkins, ed—*Van Nostrand,* 435 p., $4. A thorough and comprehensive textbook, useful also as a general reference work.

Science News Letter, December 30, 1939

Documentation

ARCHIVES AND LIBRARIES—A. F. Kuhlman, ed.—*American Library Assoc.,* 108 p., $1.75. Papers presented at the 1939 conference of the American Library Association, representing the joint program of the Committee on Archives and Libraries of the A. L. A., the Pacific Coast members of the Society of American Archivists and the Historical Records Survey.

Science News Letter, December 30, 1939

Zoology—Anatomy

A LABORATORY MANUAL OF VERTEBRATE EMBRYOLOGY, Anatomy of Selected Embryos of the Frog, Chick, and Pig—F. B. Adamstone and Waldo Shumway—*Wiley,* 87 p., $1.25.

Science News Letter, December 30, 1939

Physiography

A WORKBOOK AND LABORATORY MANUAL IN EARTH SCIENCE (PHYSIOGRAPHY)—Donald B. Stone; Edward S. C. Smith, ed.—*College Entrance Book Co.,* 278 p., 88 c. UNIT TESTS IN EARTH SCIENCE to accompany the above, free with each Workbook.

Science News Letter, December 30, 1939

Economics—Forestry

A SURVEY OF RESEARCH IN FOREST LAND OWNERSHIP — Special Committee on Research in Forest Economics—*Social Science Research Council,* 93 p., 60 c. A carefully documented study, going into all phases of forest land ownership and use.

Science News Letter, December 30, 1939

Botany

A SECOND BOOK OF PLANT NAMES AND THEIR MEANINGS—Willard N. Clute—*Willard N. Clute & Co.,* 164 p., $3. A veteran botanist tells the stories back of shamrock, Jerusalem artichoke, *Aquilegia, Cynoglossum,* and many another plant name, both botanical and "vulgar".

Science News Letter, December 30, 1939

Biology

AN INTRODUCTION TO ANIMAL BIOLOGY—John B. Parker and John J. Clarke—*Mosby,* 503 p., $3.75. A well-planned and unusually well illustrated text for beginning college classes, by two members of the faculty of the Catholic University of America.

Science News Letter, December 30, 1939

Zoology

THE CARE OF A SMALL RAT COLONY—Rolland J. Main—*Mosby,* 101 p., $2. Experimental work with animals, especially in nutrition, is becoming so widespread that rat colonies are becoming virtual necessities in many institutions that formerly were without them. This small book will save much work and worry to newcomers in the rat-raising business.

Science News Letter, December 30, 1939

Physics

COSMIC RAYS: Three Lectures—R. A. Millikan—*Cambridge (Macmillan),* 134 p., $2.50. A definitive and readable summary of the exploration of cosmic rays as conducted by Dr. Millikan, giving his latest data and conclusions. The introductory lecture, surveying the history of the subject, includes observations on the state of the world and the relation of science to everyday affairs, engendered by the question often put to Dr. Millikan: "What are cosmic rays good for?"

Science News Letter, December 30, 1939

Physics

STATIC AND DYNAMIC ELECTRICITY—William R. Smythe—*McGraw-Hill,* 560 p., $5. A textbook for advanced undergraduate and graduate students and for the experimental physicist and the engineer.

Science News Letter, December 30, 1939

Zoology

A PULSATING CIRCULATION APPARATUS FOR TISSUE CULTURES, EMBRYOS, AND SMALL ORGANS—J. A. Long—*Univ. of Calif. Publ. in Zool.,* v. 43, no. 10, 6 p., 1 pl., 25 c.

Science News Letter, December 30, 1939

Geology

BIBLIOGRAPHY AND INDEX OF GEOLOGY, EXCLUSIVE OF NORTH AMERICA, Vol. 6—1938—John M. Nickles, Marie Siegrist and Eleanor Tatge—*Geological Soc. of Amer.,* 471 p., $2.50. Sixth in a series of annual publications of utmost usefulness to working geologists.

Science News Letter, December 30, 1939

Chemistry

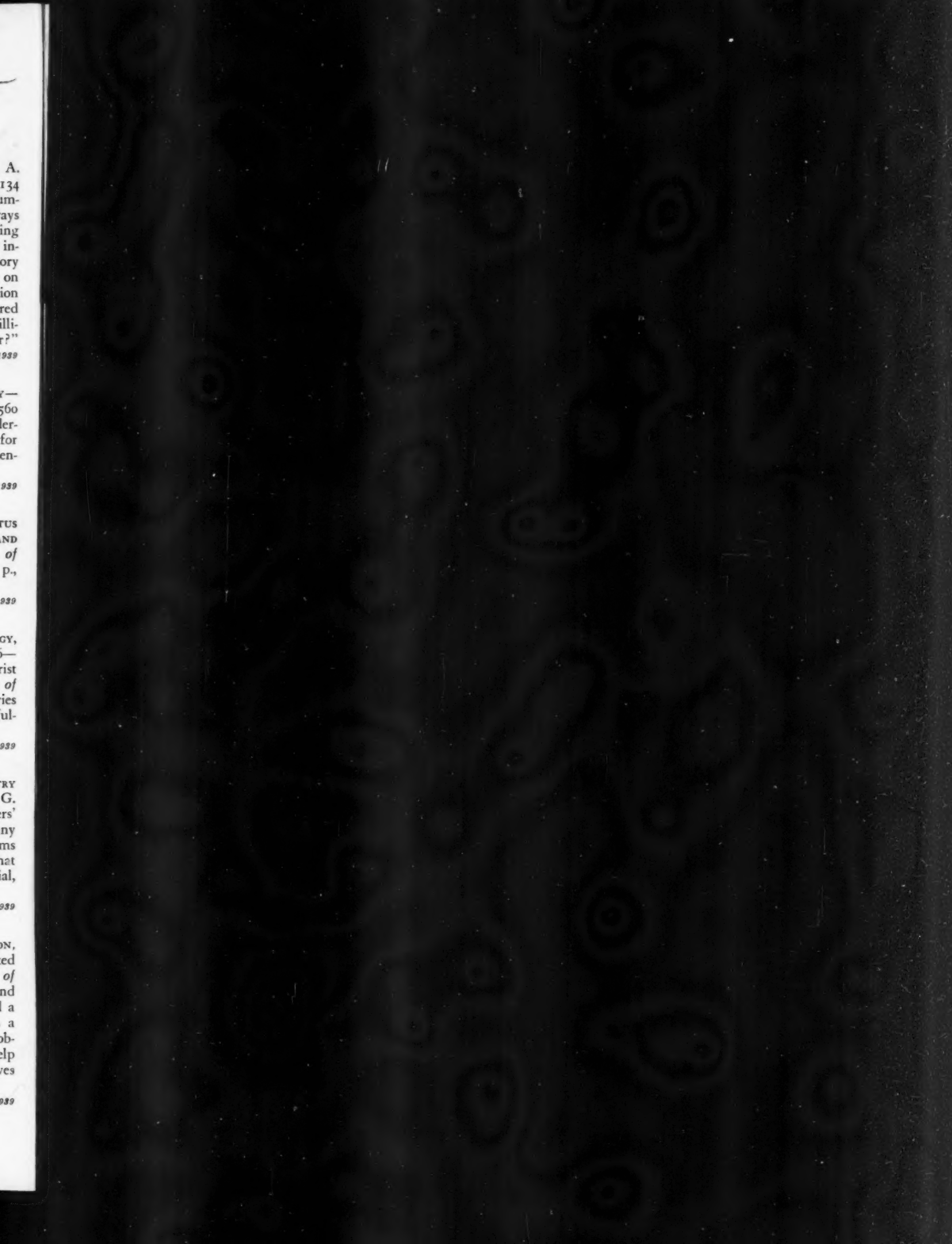
ESSENTIALS OF COLLEGE CHEMISTRY (2d ed.)—G. H. Whiteford and R. G. Coffin—*Mosby,* 534 p., $4. A beginners' text with excellent presentation, many problems and questions, fine diagrams and a glossary of chemical terms that will help many a student over the initial, difficult stages of his course.

Science News Letter, December 30, 1939

Sociology

THE FAMILY MEETS THE DEPRESSION, A Study of a Group of Highly Selected Families—Winona L. Morgan—*Univ. of Minn. Press,* 126 p., $2. Such a profound experience as the long depression had a serious effect on family life. This is a study of how 331 families met such problems as depleted incomes, lack of help in the household, dependent relatives and sickness.

Science News Letter, December 30, 1939



°First Glances at New Books

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Engineering

MACHINES AND THE MEN WHO MADE THE WORLD OF INDUSTRY — Gertrude Hartman—*Macmillan,* 278 p., $2.50. For young people is told the drama, excitement and historical origins of the machines and inventions that make the world today far different from that of our fathers. Typical chapter headings: The Horseless Carriage, When Wires First Talked, Towering Cities and Man Learns to Fly.

Science News Letter, December 30, 1939

Chemistry

QUALITATIVE ANALYSIS BY SPOT TESTS (2d English ed. trans. from the 3d German ed.)—Fritz Feigl; Janet W. Matthews, trans., *Nordemann,* 462 p., $7. The use of litmus paper to detect hydrogen ions is the most common and best known of the so-called spot tests in chemistry. Spot tests, however, have increased in numbers greatly in the last few years and here is the complete and authoritative book which tells all about them.

Science News Letter, December 30, 1939

Juvenile

IT HAPPENED IN ENGLAND — Marian King—*Albert Whitman,* 134 p., $2. Life in England presented in story-book form for child readers. Leading characters are a small girl and boy, who enjoy farm life and festivals, and come to the exciting adventure of visiting London to view the coronation. Illustrated, in color and black and white, by Hildegard Woodward.

Science News Letter, December 30, 1939

Anthropology

TABOO—A. R. Radcliffe-Brown—*Cambridge (Macmillan),* 47 p., 90c. A lecture commemorating the work of Sir James Frazer, who was first to investigate taboos systematically some 50 years ago.

Science News Letter, December 30, 1939

Electrical Engineering

THE TELEVISION HANDBOOK, LOOK AND LISTEN—M. B. Sleeper—*Henley,* 96 p., paper, $1, cloth, $1.50. Describing 1939 practice in the servicing and construction of television systems.

Science News Letter, December 30, 1939

Entomology

THE PRINCIPLES OF INSECT PHYSIOLOGY —V. B. Wigglesworth—*Dutton,* 434 p., $8. A thorough-going discussion of the physiology of a class of animals, highly important but too much neglected as a rule. It carries insects from egg to maturation and reproduction, illustrating important points with helpful diagrams. This book will be welcomed not only by entomologists and physiologists, but by all biologists.

Science News Letter, December 30, 1939

General Science

THE DEVELOPMENT OF A COURSE IN THE PHYSICAL SCIENCES FOR THE SENIOR HIGH SCHOOL OF THE LINCOLN SCHOOL OF TEACHERS COLLEGE — H. Emmett Brown — *Teachers College, Columbia Univ.,* 205 p., $2.25.

Science News Letter, December 30, 1939

Mineralogy

STRATEGIC MINERAL SUPPLIES — G. A. Roush—*McGraw-Hill,* 485 p., $5. Experts of the War Department, charged with the gathering of strategic minerals for emergency stockpiles, report that this work is excellent for the 12 minerals it covers.

Science News Letter, December 30, 1939

Natural Hisory

"NATURE TALKS", A Book of Days—Alice C. Erwin; Caroline Harrington, ed.—*Fay Erwin,* 399 p., $2.50. Around the calendar with short essays on nature subjects, interspersed here and there with most sensitively drawn black-and-white illustrations.

Science News Letter, December 30, 1939

Engineering

SPONS' ELECTRICAL POCKET-BOOK (7th ed.)—Walter H. Molesworth and G. W. Stubbings—*Chemical Pub. Co.,* 400 p., $2.50. A reference book of general electrical information, formulae and tables for practical engineers.

Science News Letter, December 30, 1939

Engineering

ELECTRICITY AND MAGNETISM, An Introduction to the Mathematical Theory —John B. Whitehead — *McGraw-Hill,* 221 p., $3. For fourth year students in electrical engineering is this excellent text designed for studious attention.

Science News Letter, December 30, 1939

Engineering

PRACTICAL MECHANICS HANDBOOK—F. J. Camm—*Fortuny's,* 400 p., $3. For the amateur with his little home lathe and few tools, and for the professional with his great assortment of machinery, is this handbook telling the tricks of the trade and approved procedures for precision work.

Science News Letter, December 30, 1939

Horticulture

THE INDOOR GARDENER—Daisy T. Abbott—*Univ. of Minn. Press,* 117 p., $1.50. Thousands of housewives constantly complain that their mothers had "wonderful luck" with potted plants but that somehow they can't make a go of indoor gardening. This small book, understandably written and cleverly illustrated, should help materially in reviving a nearly lost art, especially since it takes into account the environmental changes that have taken place indoors since mother's day.

Science News Letter, December 30, 1939

Horticulture

MAGIC GARDENS, A Modern Chronicle of Herbs and Savory Seeds—Rosetta E. Clarkson—*Macmillan,* 369 p., $3. The ancient and intriguing lore of the herbalists is undergoing a most interesting revival, in which this book should be highly helpful. It gives historic background culled from old-time herbals, tells how to grow herbs in modern gardens, how to use them in modern kitchens.

Science News Letter, December 30, 1939

Architecture

FLOORS AND FLOOR COVERINGS — Cornelia D. Plaister—*Amer. Library Assoc.,* 75 p., 75c. Appearing as Number Two of Library Equipment Studies, this booklet analyzes installation and maintenance of all types of floors, specifically and completely. Written for librarians, it will be of equal interest to builders, homemakers, and operators of buildings.

Science News Letter, December 30, 1939

Chemistry

CHEMISTRY IN USE—Raymond B. Brownlee, Robert W. Fuller, William J. Hancock and Jesse E. Whitsit—*Allyn and Bacon,* 678 p., $1.80. A high school chemistry text as used in New York City, particularly in vocational and technical schools as a survey course.

Science News Letter, December 30, 1939

Chemistry

HANDBOOK OF CHEMISTRY (3rd ed.)—Norbert Adolph Lange, Gordon M. Forker and Richard S. Burington, eds. and comps.—*Handbook Publishers,* 1826 p., $6. Slightly larger page size and excellent typography make the information in this book easy to get at and easy to read. It contains authentic chemical and physical data useful in the laboratory and in manufacturing.

Science News Letter, December 30, 1939